

## PATENT SPECIFICATION

DRAWINGS ATTACHED

Inventor: ERNEST EUGENE GARDINER

968,568



968,568

Date of filing Complete Specification (under Section 3 (3) of the Patents Act 1949) April 26, 1963.

Application Date Aug. 9, 1962.

No. 30479/62.

Application Date Sept. 11, 1962.

No. 34615/62.

Complete Specification Published Sept. 2, 1964.

© Crown Copyright 1964.

Index at acceptance:—F4 W57; F4 R(2R3A, 2R13B, 2R13F, 5C8H1)

International Classification:—F 24 b (F 21 b)

## COMPLETE SPECIFICATION

## A device for giving a Simulated Flame Effect

We, H. FROST & COMPANY LIMITED, a British Company of 34, Fieldgate, Walsall, Staffordshire do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to a device for giving a simulated flame effect.

According to the invention a device for giving a simulated flame effect includes, in combination with electric lamp means and flicker-producing means, reflector means and a translucent viewing screen, the said reflector means having reflecting areas of upwardly-extending tongue shape simulating tongues of flame, these reflecting areas of the reflector means being arranged to reflect light from the lamp and flicker-producing means, and the said translucent viewing screen being disposed in front of the reflector means so as to be arranged to receive light reflected from the reflector means. The said reflecting areas may be of concave form. The reflecting areas may be portions of a surface which is darkened adjacent said areas, and said portions may be concave areas of embossed portions of a reflector member. In a modified construction, the reflector means has a plurality of cut-out upwardly-extending tongues of flame shape, and in another modified construction the reflector means consists of a reflector part and a mask part, the mask part being disposed in front of the reflector part and having a set of cut-out downwardly-extending tongue portions which is of complementary shape to a group of tongues of flame.

In one embodiment of the invention, the

[Price 4s. 6d.]

device forms part of an electric fire of the imitation solid-fuel type.

Figure 1 of the accompanying drawings shows, by way of example, an electric fire including a device for giving a simulated flame effect constructed in accordance with the present invention, said Figure representing a diagrammatic vertical section through the said fire.

Figure 2 is a horizontal section on the line II—II Figure 1.

Figure 3 is a front elevation view of a reflector member of the fire shown in Figure 1.

Figures 4, 5 and 6 are horizontal cross-sections on the lines IV—IV, Figure 3, V—V, Figure 3, and VI—VI, Figure 3, respectively.

Figure 7 shows a modified reflector member.

Figures 8, 9 and 10 illustrate a second modified reflector means, Figure 10 being a vertical section on the line X—X, Figure 8.

Figures 11, 12 and 13 illustrate a third modified reflector means, Figure 12 being a vertical section on the line XII—XII, Figure 11.

Figures 14, 15 and 16 illustrate a fourth modified reflector means, Figure 15 being a vertical section on the line XV—XV, Figure 14.

Referring to Figures 1 to 6 of the drawings, an electric fire of the imitation solid-fuel type has one or more bar-type heating elements such as 1 disposed in front of a trough-shaped radiant-heat reflector 2. Mounted above the radiant-heat reflector 2 is imitation fuel 3 simulating coal or wood logs, and disposed beneath the imitation fuel

3, and spaced rearwards of the back of the heat reflector 2, are red or orange coloured electric lamps 4 each associated, in known manner, with a flicker-producing device 5 consisting of an apertured spinner 6 pivotally mounted on a bracket 7. When the lamps are switched on, the hot air therefrom causes the respective spinners 6 to rotate. Red or orange flickering light from the lamp and flicker device combination is reflected forwards by light-reflector means in the form of a sheet-metal one-piece reflector 8 disposed above the rear of the lamps and flicker devices. The said reflector 8 has formed therein, by embossing, a plurality of portions of upwardly-extending flame shape, the concave faces of said portions being presented forwards and constituting polished light-reflecting areas 9 of upwardly-extending tongue shape simulating tongues of flame of undulatory or kris-like serpentine form. Those areas (shown at 10) of the front face of the reflector 8 which are adjacent the reflecting areas 9 of the said face are given a blackened light-absorbent finish. Red or orange flickering light from the lamp and flicker device combination is reflected forwards by the flame-shaped reflecting areas 9 of the reflector 8, and spaced in front of the said reflector 8, so as to receive this reflected light from the areas 9, is a translucent viewing screen 11 in the form of a panel made of a plastic and having a light-diffusing surface formed thereon by abrading on the panel a multiplicity of closely-adjacent thin horizontal, or near-horizontal, broken or unbroken transverse lines extending from one side of the panel to the other, the said screen 11 being of a construction described and shown in the Specification of our Patent Application Nos. 27726/62 and 30482/62 (Serial No. 957591). The screen 11 is of corrugated form in horizontal cross-section as shown in Figure 2.

The arrangement described above, in which red or orange flickering light is reflected forwards by the flame-shaped reflecting areas 9 to the viewing screen 11 results in the simulated appearance, to the viewer, of long upwardly-shooting flames. The reflecting areas can advantageously be sprayed with a suitable lacquer, to give the flame effect a more realistic appearance.

Any other suitable number of lamps and flicker devices, or one lamp and flicker device only, may be provided if desired.

Figures 7 to 16 show reflector means, constructed in accordance with the invention, which can be employed in place of the reflector 8.

In the modified reflector means shown in Figure 7, the said reflector means consists of a one-piece sheet metal plate 12 which is unembossed but which has flat flame-shaped reflecting areas 13 delineated on its front surface, those portions (shown at 14) of the front

face of the plate which are adjacent the areas 13 being blackened.

Figures 8 to 10 illustrate modified reflector means having a sheet-metal part 15 (shown separately in Figure 9) which has a plurality of cut-out upwardly-extending tongues of flame shape having front faces constituting reflecting areas 16, the said part 15 being associated with a rear backing plate 17 which is blackened over its front surface. The cut-out tongues may be flat, as shown; or may be transversely-curved so that the reflecting areas 16 are of concave form.

Figures 11 to 13 illustrate reflector means consisting of a reflector part 18 and a mask part 19, the reflector part 18 having a front face which constitutes a reflecting surface 20, and the mask part 19 (shown separately in Figure 13) being disposed in front of said surface 20 and having a set of cut-out downwardly-extending tongue portions 21, said set of tongue portions 21 blackened on their front face and being of complementary shape to a group of tongues of flame, whereby when the reflector means is viewed from the front those portions (indicated at 20<sup>a</sup>, Figure 11) of the front face 20 of the reflector part 18 which are seen through the mask part 19 constitute reflecting areas defined by the mask and of a shape simulating upwardly-extending tongues of flame, as shown in Figure 11.

Figures 14 to 16 show a modified reflector means having a rear backing plate 22 which is blackened on its front surface, and a swingable reflector part 23 (shown separately in Figure 16) which has cut-out tongues of flame shape having front faces constituting reflecting areas 24, the said reflector 23 being suspended by rings 25 as shown to permit it to swing to and fro under the influence of the warm air from the lamp means.

If desired the reflecting areas can be of a reflecting material sprayed on to a suitable support. Or, if required the reflecting areas can be delineated by spraying non-reflective material on to a reflecting surface so that the said sprayed-on non-reflecting material occupies an area of complementary shape to a group of tongues of flame.

Devices constructed in accordance with the invention can be included in heaters, other than electric fires of the imitation solid-fuel type, if desired. For example, a device constructed in accordance with the invention can be included in an electric convector heater having a front window through which the lighting effect can be viewed. Or, a device constructed in accordance with the invention can be included in a gas-fired heater, the said device being suitably disposed to prevent its becoming damaged by heat from the burners.

A device, for giving a simulated flame effect, constructed in accordance with the invention can if required be built for use on

its own without inclusion in an electric or other heater.

**WHAT WE CLAIM IS:—**

1. A device for giving a simulated flame effect including, in combination with electric lamp means and flicker-producing means, reflector means and a translucent viewing screen, the said reflector means having reflecting areas of upwardly-extending tongue shape simulating tongues of flame, these reflecting areas of the reflector means being arranged to reflect light from the lamp and flicker-producing means, and the said translucent viewing screen being disposed in front of the reflector means so as to be arranged to receive light reflected from the reflector means.
2. A device as claimed in claim 1, wherein the reflecting areas of upwardly-extending flame shape are of concave form.
3. A device as claimed in claim 1 or 2, wherein the reflecting areas of upwardly-extending flame shape are portions of a surface which is darkened adjacent said reflecting areas.
4. A device as claimed in claim 3, insofar as it is dependent upon claim 2, wherein the reflector means is a member having embossed therein portions which are of upwardly-extending flame shape, the reflecting areas being the concave areas of said embossed portions.
5. A device as claimed in claim 1 or 2, wherein the reflector means has a plurality of cut-out upwardly-extending tongues of flame shape having front faces constituting reflecting areas.
6. A device, as claimed in claim 1, wherein the reflector means consists of a reflector part and a mask part, the reflector part having a

front face which constitutes a reflecting surface, and the mask part being disposed in front of said surface and having a set of cut-out downwardly-extending tongue portions which is of complementary shape to a group of tongues of flame, whereby when the reflector means is viewed from the front those portions of the front face of the reflector part which are seen through the mask part constitute reflecting areas defined by the mask and of a shape simulating upwardly-extending tongues of flame.

7. A device, for giving a simulated flame effect, which is constructed in accordance with any one of the preceding claims, and which is included in an electric fire of the imitation solid-fuel type.

8. An electric fire, substantially as herein described with reference to Figures 1 to 6 of the accompanying drawings.

9. An electric fire, substantially as herein described with reference to Figures 1 to 6 of the accompanying drawings as modified by Figure 7 thereof.

10. An electric fire, substantially as herein described with reference to figures 1 to 6 of the accompanying drawings as modified by Figures 8 to 10 thereof.

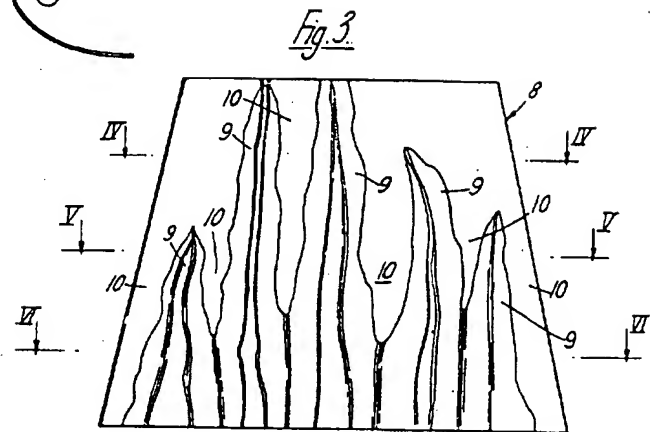
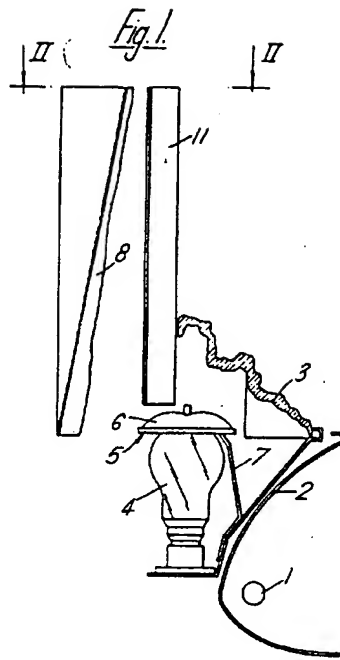
11. An electric fire, substantially as herein described with reference to Figures 1 to 6 of the accompanying drawings as modified by Figures 11 to 13 thereof.

12. An electric fire, substantially as herein described with reference to Figures 1 to 6 of the accompanying drawings as modified by Figures 14 to 16 thereof.

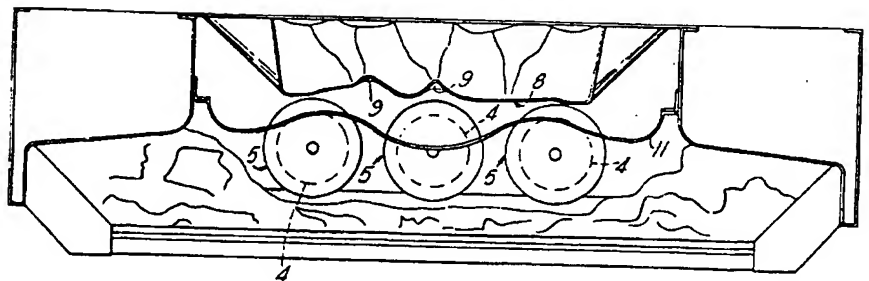
H. N. & W. S. SKERRETT,

24 Temple Row,  
Birmingham 2.

Agents for Applicants.



*Fig. 2*



968568

COMPLETE SPECIFICATION

4 SHEETS

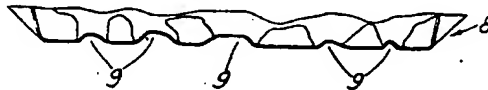
This drawing is a reproduction of  
the Original on a reduced scale

Sheets 1 & 2

*Fig.4*



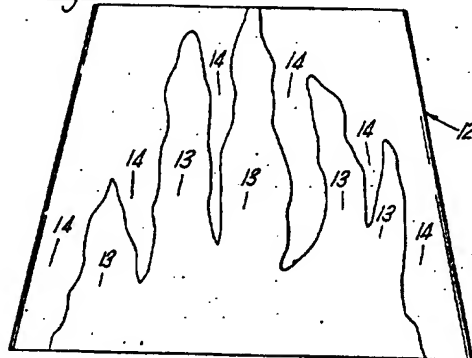
*Fig.5*



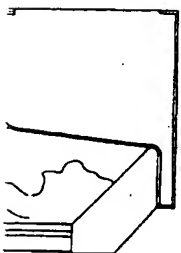
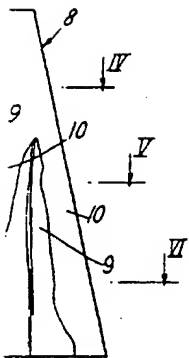
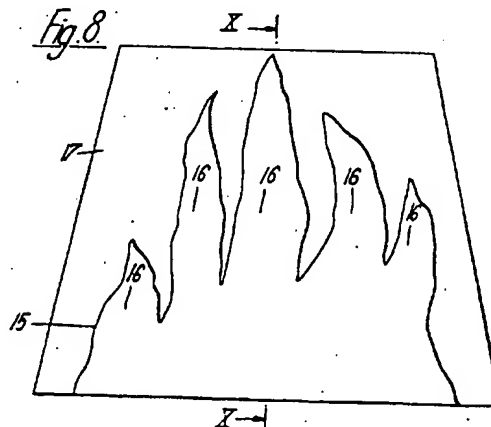
*Fig.6*

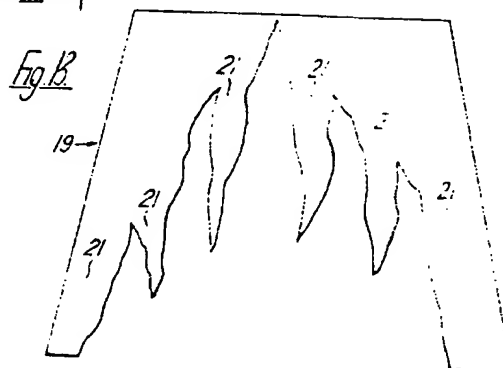
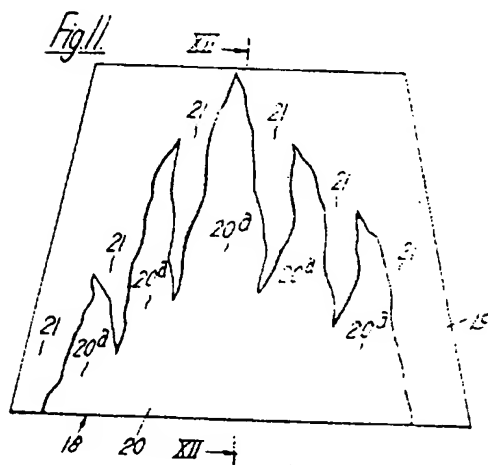
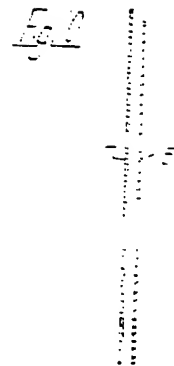
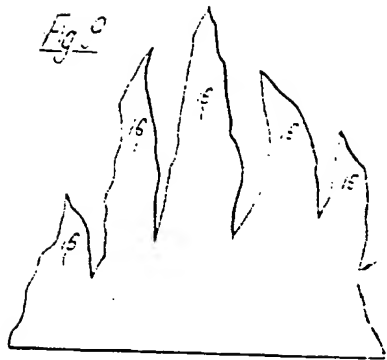


*Fig.7*



*Fig.8*

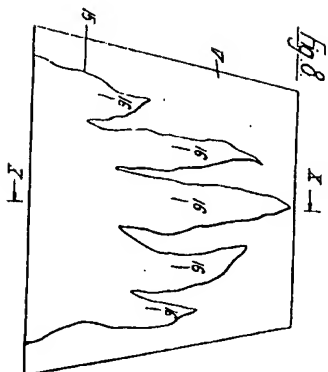
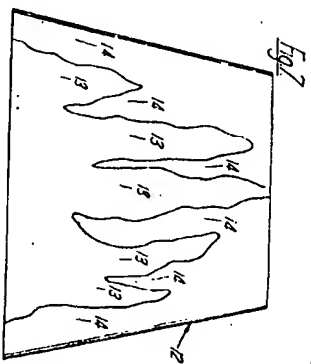
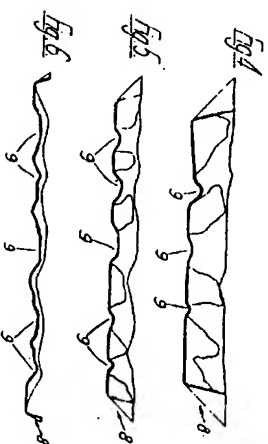
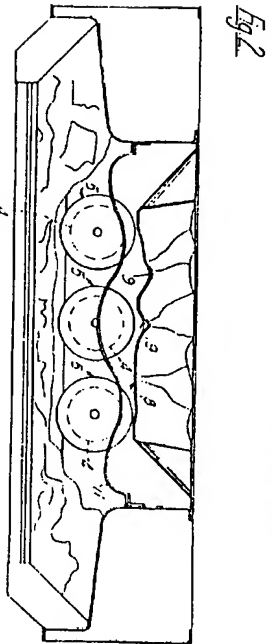
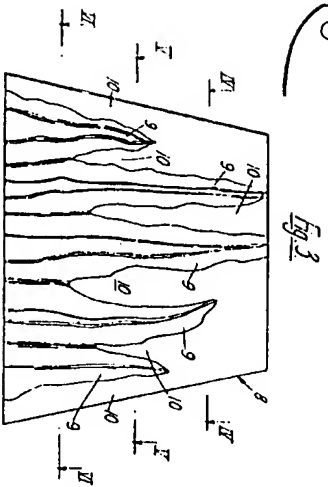
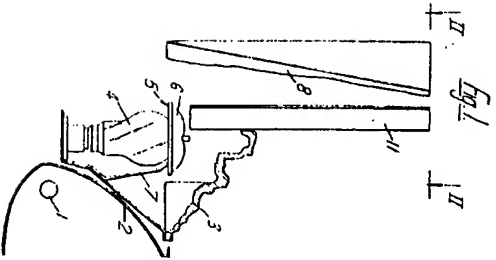




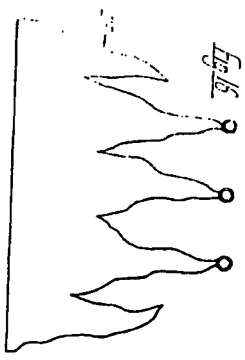
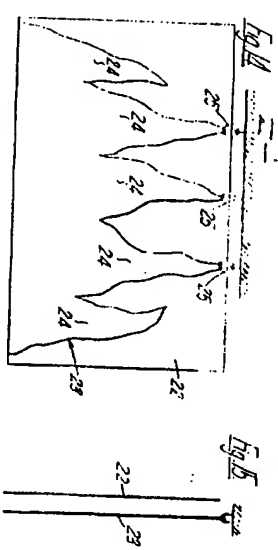
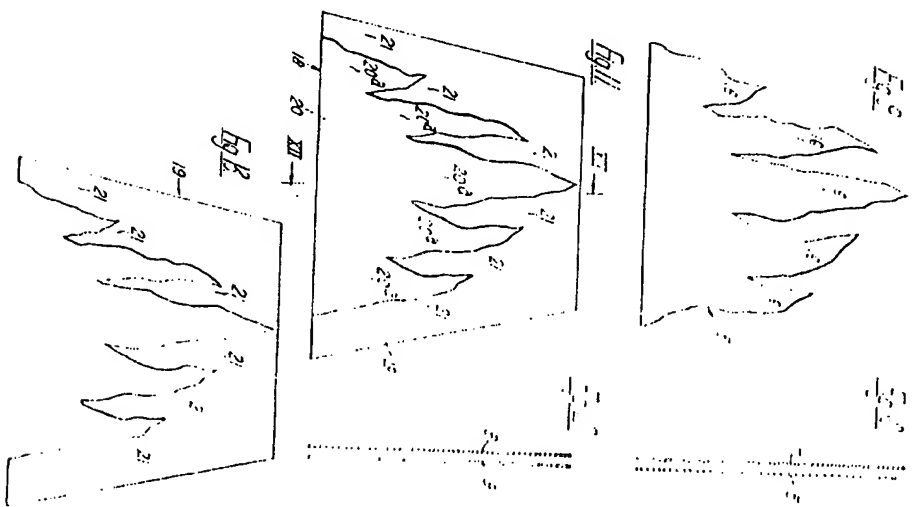
## SHEETS

This drawing is a reproduction of  
the Original on a reduced scale  
Sheets 3 & 4









968568 COMPLETE SPECIFICATION  
SHEETS This drawing is a reproduction of  
the Original on a reduced scale  
Sheets 3 & 4

**This Page is Inserted by IFW Indexing and Scanning  
Operations and is not part of the Official Record**

**BEST AVAILABLE IMAGES**

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images include but are not limited to the items checked:

- ☐ **BLACK BORDERS**
- ☐ **IMAGE CUT OFF AT TOP, BOTTOM OR SIDES**
- ☐ **FADED TEXT OR DRAWING**
- ☐ **BLURRED OR ILLEGIBLE TEXT OR DRAWING**
- ☐ **SKEWED/SLANTED IMAGES**
- ☐ **COLOR OR BLACK AND WHITE PHOTOGRAPHS**
- ☐ **GRAY SCALE DOCUMENTS.**
- ☒ **LINES OR MARKS ON ORIGINAL DOCUMENT**
- ☐ **REFERENCE(S) OR EXHIBIT(S) SUBMITTED ARE POOR QUALITY**
- ☐ **OTHER:** \_\_\_\_\_

**IMAGES ARE BEST AVAILABLE COPY.**

**As rescanning these documents will not correct the image problems checked, please do not report these problems to the IFW Image Problem Mailbox.**